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## ORIGINAL COMMUNICATIONS.

ART. I.—*The Pathology of Fevers; or observations critical and experimental in reference to the nature, varieties, causes and treatment of Fevers.*—By N. S. Davis, M. D., Prof. of Pathology, Practice, and Clinical Medicine in Rush Med. College; member of the Amer. Med. Association, &c. &c.

### CAUSES OF FEVER.

Having in former articles considered somewhat in detail, the nature and varieties of Fever *, I shall now proceed to examine briefly those agencies or causes which are capable of so acting on the human system as to give rise to febrile phenomena. In the articles just alluded to, I have claimed that all the tissues of the living body were possessed of two essential and elementary properties. By the first, the elementary cells and molecules are disposed to assume and maintain a certain definite position in relation to each other, constituting the organization or texture of parts.—This definite arrangement of the matter composing the several elementary structures, I have called their *tonicity*. Thus when the affinity of cell for cell &c., is diminished in any or all the tissues, rendering them lax in texture and consequently feeble in the performance of their function, the *tonicity* is said to be diminished; and *vice versa*. By the second, each organized cell, fibre, or tissue is rendered capable of receiving and responding to impres-

* See a series of articles published in the 2nd vol. of the North Western Med. & Surg. Journal.

sions. By it, the nerves and fibres are rendered capable of receiving and transmitting impressions; the muscular fibre, of contracting on the application of nerve influence, electricity or other stimulants; the capillaries, of responding to the presence of blood in them, &c. &c. This property, this inherent in all living matter, I have called *susceptibility;* and have considered it capable of being increased or diminished by the action of various agents.

So long as these two properties, tonicity and susceptibility, preserve their natural condition and relations to each other, so long will the various functions of the system remain normal and health be preserved. If through any morbific influence one or both of these properties are disturbed in only one organ or tissue, *local* disease or derangement of function will follow. If the morbific influence, acting through the blood, reaches the properties of all the tissues at the same time, universal disturbance of function must follow.

Hence I have defined *fever* to consist essentially in a disturbance of the elementary properties of the whole body; while the particular character of the fever will depend on the *direction* given to the altered properties. If the cause act in such a manner as to increase tonicity and susceptibility throughout the tissues, a true stenic or inflammatory grade of fever will be produced; if in such a way as to diminish or depress both properties, the resulting fever will necessarily exhibit a low or *typhoid* character; and if the cause possesses specific qualities capable of depressing one property and at the same time exalting the other, it will induce a fever of a specific character, differing alike from the inflammatory on one side and the typhoid on the other. And here I have claimed an explanation both of the *oneness* or unity of fevers, and their diversity. All fevers are a *unit*, inasmuch as they arise from disturbance of the same general properties, while they are widely *diverse* in their phenomena and results, because these properties are disturbed in different directions by exciting causes differing essentially in their nature.

In accordance with these views concerning the nature of fevers, I shall consider the *causes* under the three following heads, viz.:

1st. All such agents as are capable of exalting or increasing both susceptibility and tonicity.

2nd. Such as directly diminish both these properties.

3d. Such as exert a specific influence, increasing susceptibility and either diminishing tonicity or allowing it to remain normal.

Under the first of these divisions are included all causes capable of generating the fevers termed *Synocha*, by Cullen, Irritative and Inflammatory by Tweede, and Irritative or simple continued fevers by Dr. Wood. They are not numerous, nor are the fevers to which they give rise, as frequently met with as the other varieties, unless we include under this head those symptomatic fevers depending directly on local inflammation. The latter is so frequently the cause of this grade of fever, that many have expressed the opinion that it is always accompanied by inflammation in some of the structures of the system. Though not intending to include a consideration of mere symptomatic fever in these articles, yet an inquiry into the mode by which general febrile symptoms are produced as a consequence of local inflammation, may not be wholly irrelevant or unprofitable. That all acute inflammations of any considerable extent are soon followed by those symptoms which are universally denominated febrile, is well known; but *in what way* does the local affection act on the general properties to such an extent as to produce that universal derangement of functions which constitutes fever?

A satisfactory answer to this question is not as easily given as many would suppose. Broussais attributes the general disturbance to an irritant impression transmitted, through the medium of the nerves, from the inflamed part to the Brain, and from this reflected over the whole system. If this were true, we should always be able to trace special cerebral disturbance anterior to the general febrile phenomena, and the latter should bear a direct ratio to the former; neither of which is in acccordance with the daily observations of the profession

Others have attributed the general symptoms to the *shock* produced by the rapid congestion and other changes which take place in the inflamed part. But the word *shock* is as mysterious as any other, and consequently explains nothing. A larger number of writers, seeing that the fibrine of the blood is rapidly increased in most inflammations, have attributed the febrile excitement to the

stimulant effects of the superabundant quantity of this constituent. Two facts, however, are strongly opposed to this view. The first is that the febrile symptoms often appear in their greatest intensity before the accumulation of fibrin has taken place to any considerable extent in the mass of the blood, and still more frequently disappears before the excess of fibrin is removed. The second fact is that the intensity of febrile action does not bear any uniform and direct ratio to the degree of increase in the quantity of fibrin. These may not be sufficient to justify the conclusion that the excess of fibrin exerts no exciting or irritating influence, but they are sufficient to show that it is not the *chief* cause of such action.

I am induced to believe that local inflammation induces fever either by its effects on the nervous system, or by its interference with some of the excretory functions; and in most cases by both these combined. The effect of inflammation on the nervous system alone is seldom capable of inducing more than a very moderate and ephemeral form of fever. Yet we see very often patients suffering under a distinct general febrile movement, resulting solely from a *whitlow* on the finger, for instance. The part involved in the inflammation is not such as to interfere with any secretory or eliminating function, neither of sufficient extent to materially alter the proportion of fibrin or any other constituent of the blood. But the extreme pain resulting from the irritation of nervous filaments involved in the part, is of itself sufficient to disturb, in a moderate degree, all the functions of the system; causing rigors, pains in the head and back, increased heat of skin, and frequency of pulse, restlessness, &c. Doubtless in such cases sufficient morbid impression or irritation is transmitted through the nervous filaments and connections to produce the general disturbance.

The suddenly developed paroxysms of fever which result from the irritation of worms in the alimentary canal arise chiefly from the same cause. The portion of mucous membrane in contact with the worms, is not inflamed to such a degree as would either suspend secretion or fill the blood with fibrin; but it involves a condition of the nervous filaments in the part, which is rapidly trans-

mitted to the ganglionic and cerebro-spinal systems; thereby inducing rapidly a general excitement, which is usually as ephemeral or transitory as it is rapidly developed.

But in all the more important and lasting cases of symptomatic fever, the structures involved in inflammation are such that disturbance of one or more functions of importance necessarily results co-incidently with the beginning of the local disease. And such is the intimate relation and dependence of one important function on all the others, that no sudden disturbance of one can take place without inducing more or less change in all. Thus disease, occupying any considerable part of the cutaneous surface, suspends the elimination from the skin, causing, on the one hand, rapid accumulation of perspirable matter in the blood; thereby exerting a universal irritant influence; and on the other, equally rapid accumulation of heat from the diminished insensible evaporation, by which, in health, the caloric on the surface of the body is constantly being rendered *latent*, and conveyed away. From these two alterations—the retention of irritating matter in the circulating fluids, and the accumulation of caloric, general febrile symptoms are very quickly developed. Again, inflammation of any portion of the respiratory apparatus sufficient to materially impede respiration quickly alters the interchange of oxygen and carbonic acid through the lungs, thereby altering the quality of the blood, and, through it, the functions and properties of the system.

If we bear in mind the fact, that every change in the capillary circulation is accompanied by a change of function, we shall see that the first step in the inflammatory process, namely, determination of blood to, and its accumulation in the inflamed part, almost necessarily involves more or less alteration in the capillary circulation generally, and consequently must induce at once some general disturbance.

Add to this the irritant impression made on the nerves of the part, and through them transmitted to the important nervous centres, together with the rapidly increasing alterations of the blood, by the retention of materials designed for elimination; and there can be no difficulty in comprehending the process by which active

local inflammation is soon followed by that general functional disturbance which constitutes fever.

But the same *sthenic* or inflammatory grade of febrile action may, and often does occur from other causes, without the intervention of any local inflammation.

The most important of these causes is the application of cold to the surface of the body, and the rapid alternations of temperature. To operate as an exciting cause of the sthenic grade of fever, the application of the cold must be made suddenly, and continued only for a limited period of time. Cold applied in this way produces a twofold effect—namely, a direct diminution of the capillary circulation throughout the exterior of the body, with corresponding diminution of the cutaneous exhalation, and of organic or molecular action. While this condition exists there is not only a failure to eliminate from the blood effete matter, in the form of insensible perspiration, but the restricted organic action in the exterior retards, of course, the process of nutrition, disintegration, and calorification. Hence, when the action of the cold ceases, the blood contains the retained effete perspirable matter, the exterior tissues contain particles that should have been removed by the process of disintegration, which prove directly irritant to the nervous and vascular systems. All these combined tend to develop rapidly an *irritant* influence throughout the whole system. This irritant action, coupled with the accumulation of caloric from the diminished cutaneous exhalation, soon establishes the re-action or general febrile movement. If the action of the cold has been pretty intense, but temporary, the resulting febrile action will be characterized by increased nervous sensibility and high vascular excitement. But if the action of the cold is less intense and more protracted, the sensibility of the tissues becomes diminished instead of increased; and though fever may result from the ultimate accumulation of excrementitious matter, yet the grade of morbid act on will be *asthenic* rather than inflammatory.

The action of cold as an exciting cause of fever is much increased if it is accompanied by dampness. An atmosphere highly saturated with moisture, not only increases the effects of the cold

on the cutaneous function, but it diminishes to a great extent also the exhalation of aqueous vapor from the lungs, thereby causing the retention of a small amount of animal matter, and a large amount of caloric which should have been rendered latent in the aqueous vapor thrown out with each expiration. Hence it is that all writers agree in attributing common continued and ephemeral fevers, characterized by sthenic excitement, to exposure to cold and wet, and sudden atmospheric changes. Thus Dr. Wood says, "the most frequent cause is probably exposure to cold. Persons who have been caught in a cold rain, and remain for some time with their wet clothes upon them, are apt to be attacked." And he very properly adds that, "whatever is capable of producing *irritation* in one or more of the important organs of the body may give rise to this kind of fever." Hence, the presence of indigestible food in the stomach, of worms in the bowels, and the irritation of teething, are generally enumerated among the exciting causes of irritative fever. But all the causes which have been mentioned except local inflammation, so frequently exist without producing fever, that most writers acknowledge the necessity of some previous predisposition. In what that predisposition consists few have attempted to explain.

It will doubtless be found in most cases, to depend on an impairment of the mutual sympathy and compensating action which always exists, in a strictly healthy condition of the system, between the more important functions of the body. This sympathy is most prominently displayed between the skin and kidneys on the one hand, and the lungs and liver on the other.

The two first eliminate from the system chiefly nitrogenous matter, and the two last carbonaceous. The compensating action of the two first is so frequently and prominently exhibited that the most careless observer would scarcely fail to notice it. Thus whenever a healthy individual is exposed during the day to a moderately cold atmosphere, the exhalation from the surface is much diminished, while the quantity of urine discharged is proportionately increased; and so long as this continues no derangement of health ensues from the action of the cold. But let this compensating action of the kidneys cease, and the action of the cold on the

surface, quickly produces the retention of a sufficient quantity of effete and waste matter in the blood to arouse the susceptibility of the whole system and establish the phenomena of fever. There are many facts which induce us to believe that a similar functional relationship exists between the lungs and liver, although the relative functional activity of both is less open to observation or manif st to the senses. Thus the occurrence of a bilious diarrhœa frequently relieves very much the consequences of severe obstructions in the lungs, and occasionally proves critical, being followed by speedy convalesence. Again, that season of the year and those locations which give rise to an atmosphere both warm and damp, are accompanied by the smallest degree of elimination of carbonic acid gas from the lungs, on the one hand, and the prevalence of diseases characterized by an excessive flow of bile on the other. This is verified during the latter part of summer and autumn in all malarious districts; while just the reverse is seen during the cold season when the atmosphere is dense and more dry.

Nature has thus provided the human body with organs capable of affording to each other a mutually compensating action, at least to an extent sufficient to preserve it from harm from the ordinary changes in the elements around us.

But whenever that mutual sympathy is interrupted or materially impaired by previous exposures or debilitating influences, then it is that the action of any cause, capable of disturbing one or more of the important functions of the body, is sufficient to develope febrile phenomena. And it is more than probable that the *predisposition* to this or that disease, of which authors so frequently speak consists in this impaired power of compensating action between the different excretory organs of the system.

Prominent among the predisposing causes of the sthenic grade of fever, are age, temperament, and season.

It is during the period of childhood and youth, before the physical system has attained its full developement, that far the larger proportion of cases of this form of disease occur. It is during this period of life that the blood contains the largest relative proportion of nutrient matter, the tissues their highest degree of susceptibility, and the organic movements take place with the

greatest rapidity. Hence it is the period above all others, when excited action is most readily induced. The strongly marked sanguine temperament presented in adult life doubtless predisposes to the same kind of morbid action. The essential elements of such a temperament are a fully developed vascular system, a ready excitability, and blood containing a full proportion of red corpuscles; all conditions favorable to the occurrence of excited action coupled with strength. The influence of seasons in predisposing to the prevalence of the common irritative or sthenic cases of fever is perhaps not as readily observed as that of age. My own observations, however, have led me to the conclusion that they are met with most frequently at the beginning and the end of the cold season.

The steady and intense cold of mid-winter generally depresses the susceptibility of the system too much, and the heat of summer induces too great laxity or loss of tonicity, while the moderate coldness of early spring and late autumn gives the proper degree of tonicity without depressing the susceptibility, thereby presenting the system in a condition favorable to the morbid influence of the frequent changes which characterize these seasons.

*Causes which depress the elementary properties.*

The second class of causes which require consideration, though numerous and diverse in their nature, yet all agree in two essential qualities, namely, the power to act upon or influence the general or elementary properties of all the issues, and to act in such a manner as to depress or diminish those properties. This latter quality distinguishes them from the agencies mentioned in the first class.

Most, if not all of the causes included in this class also differ from those mentioned in the first in another respect.

The latter, as we have seen, act primarily on particular organs and functions, and through them on the general properties of all Hence the general functional disturbance or febrile movement, resulting from their action, is a secondary effect; while those belonging to the class now under consideration are capable of exerting a direct influence on those properties which belong to all the

tissues, and consequently capable of inducing, primarily, alterations of function in all the organs of the body. The chief causes included in this class are the following, viz.: The protracted influence of cold; deficient nutriment; excessive exercise; continued mental depression and anxiety; impure air; and some of the products of the decomposition of animal and vegetable matter.*

These several causes may act singly, though two or more of them frequently co-exist and exert their influence on the sytem at the same time. Thus protracted cold is often united with excessive exercise or insufficient food. So too among the poor especially, impure air is often associated with both mental depression and unwholesome food. Indeed, it is rare that any one of the causes named, except the animal poisons, act with sufficient intensity to cause the direct developement of idiopathic fever. And yet they are each of sufficient importance to require a brief examination in reference to their *modus operandi.*

*Cold.* "Under the local influence of cold," says Dr. Wood, "the tissues shrink, the capillaries circulate the blood less vigorously, secretion is checked, sensibility is impaired, and the part becomes pale from the want of blood, or purplish from its stagnation. Should the application continue with intensity, a deadly whiteness ensues, circulation ceases entirely, sensibility is lost, and, though vital power is not immediately destroyed with the loss of action, local death soon follows unless the cause be removed.

When the influence is general, the whole surface undergoes the change above described; while the interior functions exhibit a similar depression. The heart acts by degrees more and more feebly a general torpor steals over the senses, the movements become tottering from muscular weakness, and the benumbing influence extends at last to the brain, giving rise to wandering of the thoughts, drowsiness, and finally an irresistible propensity to sleep."†

Dr. Williams in his Principles of Medicine remarks as follows, viz.: "Cold, on the other hand, is directly sedative. It contracts

* Under this head I include what is generally called contagion.
†See Wood's Practice of Medicine, vol. 1. p. 142.

tissues and vessels, especially the arteries, and thus at first renders parts pale and shrunk. In persons of feeble circulation, after bathing, the fingers are sometimes quite bloodless and numb from this cause; the cold having quite closed up the arteries. But cold also retards the passage of the blood in the capillaries; the viscidity of the Liquor Sanguinis seems to be increased; globules stick to the sides or move but slowly, and the part soon becomes purple or blue, from the congestion of blood in it. There is also much internal congestion from the intropulsive operation of the cold—that is, the external parts being constricted and obstructed, blood accumulates more in internal parts, and the heart's force is more expended on these." The idea here expressed, that the action of cold produces "internal congestion," from its *intropulsive* operation, is one very generally entertained. But Dr. Wood goes further, and not only claims internal congestion of blood, but of nervous energy also. His language is as follows: "Another method in which cold may produce disease is, by the concentration of blood and of nervous energy in the interior organs, consequent upon their retrocession from the skin, and the parts which sympathize with the skin. It is obvious that the quantity of blood is diminished in the superficial vessels. It must necessarily, therefore, be increased in those within. It is equally certain that nervous action is depressed upon the surface; and it is highly probable that this also is concentrated in the interior organs. Excess of blood, and excess of nervous energy combined, cannot but frequently eventuate in disease." This language plainly implies that nervous energy is a something not only capable of circulation, but definite in *quantity*, like the blood; and like it, when driven from one set of organs, accumulating in another. He thus gives to the mere *property* of a particular tissue, all the essential qualities of a separate *entity*, as plainly as Van Helmont did to his *Archeus*. It is scarcely necessary to say that I regard such an assumption as purely hypothetical, and better calculated to mislead than to enlighten the reader. But, aside from this, is there anything in the phenomena which accompany exposure to cold, which really indicate the existence of either an *increased* amount of blood, or of nervous

energy in the internal organs of the body? Certainly there is not, so far as those phenomena are detailed to us by Drs. Wood, Williams and others who have written on the subject; or by those who have suffered in their own persons the effects of extreme cold. To study this subject intelligibly we must keep in mind the well known phenomena of congestion or accumulation of blood in the internal organs, that we may the more accurately compare such phenomena with those represented to arise from the effects of cold. By internal organs we usually meant those viscera which occupy the cavities of the cranium, the thorax and the abdomen.

If the reader will turn to the accounts of congestion in the Brain, the Lungs, Heart, or abdominal viscera, given by any of the writers on Pathology or Practical medicine, he will readily perceive striking differences between the symptoms there detailed, and those resulting from the action of cold.

Simple congestion or accumulation of blood in the brain, for example, produces a sense of fulness, heaviness and vertigo; and if it be increased, these give place to stupor, coma, or paralysis, with fulness of the pulse and more or less laborious respiration. If *increased nervous energy* or irritation exist in the brain at the same time, we have in addition to the other symptoms, increased heat of the head, flushed face, fulness of the carotids, and delirium or spasmodic muscular action, or both. In searching the interesting accounts of the action of extreme cold, given us by Sir Joseph Banks, Dr. Solander, Dr. Edward Daniel Clarke, and others, we shall find no mention of any of these symptoms. On the contrary the only appreciable change in the brain is a gradual impairment and final suspension of its action. Hhence the first morbid feeling is that of want of power, the acts of the will are performed with difficulty; the individual feels conscious that thinking requires an effort, and there is nothing he so much desires as to suspend all thought, all effort of mind or body, and be allowed to sink, not into comu, convulsions, or paralysis, but a perfectly quiet sleep; during which the already feeble action should cease altogether. So different are these symptoms from those arising from accumulation of blood and nervous energy in the brain that Dr. John Whiting very justly observes, "that it is hardly pos-

sible to determine whether they are the direct result of the action of the cold as a sedative on the brain, or whether they depend on *a want of the due supply of blood to that organ*, on account of the diminished action of the heart." It is true that Dr. Kellie has reported in the Edinburgh Medical Journal some cases of death after severe exposure to cold, in which he found more or less serous effusion in the brain; but in all these, death took place, not from the *direct* action of the cold, but sometime after both "heat and circulation had been restored."

If we examine the symptoms derived from the heart and lungs, we shall find still less real evidence of congestion or accumulated nervous energy during the action of the cold.

Pulmonary congestion is generally accompanied by two things manifested in a greater or less degree: first, dyspnœa, or at least imperfect inspiration, and imperfect decarbonization of the blood. But difficulty of breathing, or imperfect respiration, is nowhere mentioned as one of the phenomena observed during extreme cold, and so far from there being evidence of deficient decarbonization of the blood, various experiments go to show that blood remains arterial through out the whole vascular system.

Thus Chossat found in animals, killed by cold, the blood of arterial color in both ventricles of the heart; and Sir Astley Cooper found that "on plunging kittens into ice cold water the arteria blood did not become venous in the veins."

In regard to the heart, Dr. Wood, himself says, that under the influence of cold it "acts by degrees more and more *feebly*;" which surely is not an evidence of the "accumulation of blood and nervous energy" in it. The latter would necessarily lead to increased action in the heart, calculated to expel the supposed increased quantity of the former; thereby exhibiting an unusual degree of cardiac impulse, instead of one progressingly more and more feeble. A writer in the Encyclopædia of Practical Medicine comes much nearer the truth when he says, "it is very probable that the sedative action of cold on the circulating system is to be ascribed to a *diminution* of the *irritability* of the muscular fibres of the heart and blood-vessels." Among the many cases recorded of death from the direct effects of cold, I have searched in

vain for any evidence of internal congestions, derived from *post mortem* examinations. Indeed, from a careful examination of the subject, I have been led to conclusions entirely different from those commonly entertained and very fairly expressed in the quotations from Drs. Williams and Wood. The common opinion is based directly on the assumption that the quantity of blood is diminished in the surface and parts most exposed to the cold, and therefore must "*necessarily*" be *increased* in the parts within. The idea of "*intropulsive action*" is founded altogether on the supposition that the blood forsakes the surface—that its quantity is absolutely diminished in the exterior parts. But is this fundamental or primary proposition true? It is true that the application of cold condenses the tissues, thereby causing the vessels to be smaller, but it equally condenses the blood and fluids in them, rendering, as Dr. Williams says, the liquor sangwinis more viscid, causing the globules to 'stick to the sides of the vessels or move but slowly," and consequently directly retarding the passage of the blood in the capillaries. At the same time that the blood is thus altered in its density and movement through the capillaries, the susceptibility of the tissues is diminished, and those organic movements by which new particles are added to the elementary structures and old ones removed, are retarded or entirely suspended.

This, of course, retards in an equal ratio the secretion, the production of animal heat, and the change from arterial to venous blood in the systemic capillaries. The inevitable consequence of all these changes would be, not an "*intropulsive movement*," by which the blood and nervous energy should accumulate within, but a direct and progressively increasing retardation of both circulation and organic change in the exterior or parts exposed to the cold; thereby allowing absolutely less blood to be returned to the heart in a given time; and what is returned has a diminished temperature, and less of the materials usually derived from the systemic capillaries—in other words, less venous in its color. The blood returned to the heart thus reduced in its temperature and quantity, fails to sustain the susceptibility and action of the heart, brain, &c.; thereby causing that *sedative* action, which, by long continuance or increase, results in entire suspension of action and death.

Such, I believe, is the true mode in which cold produces its effects on the human system. It condenses the blood and tissues, and diminishes the elementary susceptibility; thereby retarding organic and capillary action, the production of animal heat, and secretion, in the parts exposed; and causing the blood to return to the heart in less quantity, and at a lower temperature, by which the functions of the brain, the heart, and all the internal organs are enfeebled or suspended, according to the intensity and duration of the cold.

If the application of cold be of short duration and of only a moderate degree of intensity, the temporary condensation and diminished action only causes the retention in the part of sufficient blood and effete matter to prove gently irritant or excitant as the action of the cold ceases, and the tissues again relax. No sooner, however, has the cold ceased than this moderately irritant action induces an increased circulation and organic action, and thereby increased heat and redness, and this constitutes the *reaction* from the effects of cold When the re-action thus induced is moderate, it soon disappears and the sensation of warmth, which accompanies it, is pleasant rather than otherwise. In persons with *lax* tissues and morbid susceptibility, these slight reactions from the temporary application of cold, repeated at suitable intervals, may be made to act as an efficient tonic. But if the application of cold be more protracted or intense, the altered density together with the stasis of blood and fluids, so alters and excites the tissues on the return of warmth, that the re-action constitutes inflammation. The latter may end in the formation of *chilblains*, in suppuration, or in gangrene.

It is the long continued influence of a moderate degree of cold which induces results of the most etiological importance. In such cases, the degree of cold is not sufficient to induce rapid changes, but its long continuance gradually lowers down the susceptibility of the tissues, and sooner or later, accumulates in them sufficient effete matter from the diminution of organic action and secretion to disturb the various functions of the body. Such disturbance, however, will always be of an asthenic or depressed character.

The *poor*, during the cold season of the year, not unfrequently

suffer from this protracted influence of moderate cold, often determining in them the developement of fevers of a low grade.

Hence, Dr. Wood very justly remarks, that, "the long continued influence of a moderate degree of cold is apt to wear out the powers of reaction, especially when aided by want of food, and other sedative agencies. A state of the system is thus produced, highly favorable to typhous and scorbutic diseases; and when the individual may be attacked with another disease, even though inflammatory, it is apt to assume a low asthenic, or typhoid character.

I believe, also, that a strong predisposition may thus be developed to phthisis or scrofula, or an existing pre-disposition to these affections called into action."

It is not probable, that, under ordinary circumstances, the influence of the cold in depressing the properties and functions of the system, is of itself sufficient to give rise to the developement of fevers of an asthenic grade; in other words, it is not often a direct *exciting* cause; but acts rather as one of the most important *predisposing* influences. By retarding the organic changes and depressing the properties, it *determines the grade* of fever, on the occurrence of another exciting cause, without being sufficient of itself to develope the more active morbid phenomena. Thus, most of the wide-spread and fatal epidemics of *typhus*, have prevailed in the winter; and many of them in the midst of extraordinary cold ones.

It is during the same season of the year also, that this disease is apt to occur, and prevail with severity, in military camps, where large numbers are but imperfectly sheltered from the cold for several successive weeks. Under all circumstances, the injurious effects are greatly increased by the co-incidence of sufficient nourishment. This is not owing solely to the deficiency of nutritious material in the blood from the want of a proper supply, but partly also, to the fact that active digestion directly increases the production of animal heat in a noted degree. This is easily demonstrated by direct experiment, as shown by me in an essay read to the American Medical Association during its annual meeting in May, 1851.

# SELECTIONS.

*On the Remedial and Anæsthetic uses of intense cold.* By JAMES ARNOTT, M.D., London.

Although the subjects of the remedial efficacy of congelation and local anæsthesia from cold have been for some years before the public, they are as yet but little understood and appreciated. This has resulted, partly from their having been imperfectly explained, in consequence of the publications respecting them being severally incomplete, and partly from the strength of the prejudice against extreme cold. Dr. Rowley, who, in his attack on cowpox, declared that the accounts which he had heard of the terrible effects of communicating the "cruel and beastly" disease were enough to "freeze the soul," was probably not more horror-stricken than some have been by the proposal to freeze the body; and the introducer of vaccination was hardly more abused than the proposer of congelation has been. It is in the hope that this prejudice may be thereby abated, and the subject rendered better understood, that the following brief statement is published. Even in France, where both the remedial and anæsthetic uses of intense cold have been turned to account for some time by M. Velpeau, and other leading practitioners, there is still much doubt about the best mode of applying the agent. In a paper in the Bulletin de Therapeutique, of the 15th ult., M. Richet, Surgeon of the Hospital Saint Antoine in Paris, reports thirteen operations in which local anæsthesia had been produced by the very imperfect means of the quick evaporation of ether.

As no remedy has been longer in use, and few are more valued than the local application of moderate degrees of cold, or a temperature ranging from that of dissolving ice to about 70 degrees of Fahrenheit, it may at first appear singular, that a greater or more powerful remedial effect should not have been sought by increasing the dose of the agent, or employing a lower temperature, in the same manner as we have sought and found much greater remedial benefit in many cases by using mercury, antimony, quinine, and other drugs, in larger doses than had been customary. The reason is that medical men were under a most erroneous impression respecting the effects of very low temperatures on the body. Because a temperature of zero stops the circulation, and because

the vitality of a part has been lost by its *long-continued* congelation, whether caused by exposure to severe cold in winter, or by the incautious use of ice in hernia and other diseases, it was hastily and erroneously inferred that there was danger of loss of vitality from *short-continued* congelation. The mistake would not be greater to infer from the fact, because a long-continued stoppage of the circulation through a limb from an improper application of a bandage has occasioned gangrene, that it would be dangerous to use the tourniquet in operations.

The correction of this error will be deemed of no little importance when it is considered that in short-continued congelation, judiciously applied, we have an unfailing means of immediately arresting inflammation wherever it can be reached by the remedy; of not only giving speedy relief from pain in many diseases, but in consequence of the organic changes produced by it, of obviating the return of pain; and in malignant disease, of producing an amount of benefit much exceeding that yet accomplished by other means. Although much inferior in importance to these results, it is yet another great benefit conferred by intense cold, that the pain which would be otherwise caused by the greater number of surgical operations can be prevented by it with perfect safety; and not only can pain be prevented, but the inflammation proceeding from the surgeon's knife, that so often proves fatal, may also be obviated by the same means, and with almost equal certainty. It will be proper to consider the remedial and anæsthetic effects of intense cold separately; but before doing so, it is necessary to mention how this degree of cold is produced and applied, as well as to attempt an explanation of its mode of operation.

That degree of cold may be called intense which immediately benumbs the part to which it is applied, speedily stops the circulation through it, and congeals the adipose matter. I have usually produced these effects by placing what are termed frigorific mixtures either immediately in contact with the skin or mucuous membrane, by means of a net of thin guaze containing them, or by allowing them to act through thin bladders, or metallic vessels of appropriate form; but there are various other ways of effecting the same object, some of which are preferable for certain purposes. Substances passing rapidly from the solid to the fluid, or from the fluid to the æriform state, strongly abstract caloric from other bodies in contact with them; and substances, either solid fluid, or æriform, already sufficiently cooled by artificial means, may be placed in contact with the part; the first, as solid metallic balls of appropriate shape; the latter two, when forming strong currents. When cold is produced by the common frigorific mixture of ice and salt, and applied by means of a guaze bag or net, the following is a convenient mode of proceeding:—If the congelation is not to be ex-

tensive or long continued, a piece of ice of the size of a large orange will be sufficient. This is well pounded in a coarse cloth or bag, and the powder being placed upon a large sheet of paper, is thoroughly mixed, by means of a paper folder, with about half its weight of common salt. The mixture is then put into a net of about four inches diameter, and as soon as it begins to dissolve, it is ready to be applied. The net is not kept motionless on the part, but is frequently raised in order that fresh particles of the mixture may be brought in contact with the skin; and the water that escapes from it may be absorbed by a sponge, or allowed to fall into a basin placed underneath. If the surface to be acted upon is of small extent, a very thin and large copper spoon containing the mixture or a solid brass ball of about a pound weight, which has been immersed in ice and salt, will often answer and be a neater mode than the net.

The moment a guaze net, or a thin metallic vessel containing ice and salt, is applied to the skin, it is benumbed. There is hardly a sensation of cold produced, and no tingling or smarting. If the contact of the frigorific be continued a few seconds longer, the surface becomes suddenly white, in consequence, doubtless, of the arrest of the circulation; and this change of color is attended with a slight smarting like that produced by mustard. There is now complete anæsthesia, which, if the frigorific be allowed to act, another change is produced—the adipose matter under the skin is congealed, and the part becomes hard as well as white. The depth to which the benumbing influence of cold will extend depends upon a variety of circumstances, as the degree of cold, the duration of the application, the vascularity of the part, whether pressure is used or the circulation is suspended, &c., &c. After the usual application of cold for anæsthesia, the circulation soon returns to the part, and the skin assumes a red color which lasts for several hours. If the congelation has been considerable, there is now some smarting felt, unless the natural heat be more gradually restored by pouring cold water on the part, or by placing on it a little pounded ice, or a bladder containing iced water. If the application has not exceeded the first stages, there is no smarting and no necessity, therefore, for such precautions.

The redness produced does not, as might at first sight be supposed, indicate an inflammatory condition, but the very reverse. The tonicity of the small arteries appears to be lessened or suspended for a time, and instead of being inflamed, the part is rendered unsusceptible of inflammation. Parts cut after congelation heal by adhesion or the first intention more quickly than they otherwise would; and, as has already been said, we possess in this expedient a certain and prompt remedy for every inflammation accessible to its complete influence.

I. *Remedial Uses of Intense Cold.*—The remedial qualities of intense cold may be described as antiphlogistic, anodyne or sedative, and specific; and it is useful in the diseases for which other remedies possessing these qualities have been employed, viz., in inflammatory, painful or irritative, and malignant diseases. The circumstance which limits its application in these, is the impossibility of extending its influence beyond a certain extent or depth, although it is certain from its effects in deep-seated disease, that this influence, whether it be direct or sympathetic, is more extensive than would at first be supposed. It may be laid down as a rule, that in every case in which the local application of moderate degrees of cold has been found of service, the use of well regulated congelation would prove much more useful; and in those diseases of similar character, in which moderate cold has not been employed from the idea that their seat was beyond its reach, congelation might be tried with reasonable hope of success. Intense cold has this immense advantage over other powerful remedies of the same class, that may be used with impunity—if it does no good it will do no harm. Who will venture to affirm this of bleeding, mercury, antimony, opium, chloroform, arsenic? Neither in my own practice, nor (so far as I can learn) in the practice of others, has there been any untoward result from the use of congelation. Its action being confined to the diseased part, and not uselessly expended on the rest of the system, affords the explanation. Other topical remedies have much the same character for safety, but what other expedient of this class has a tenth part of the power of intense cold?

Instead of enumerating the diseases in which this agent has been employed according to the above classification, I shall mention, first, those in which it has been more or less successful; and second, those in which it might, reasoning from analogy, be tried with hope of advantage. In administering intense cold as a remedy, the common or a more powerful frigorific has been generally applied directly to the part, or with the intervention only of the thin gauze containing it; and the duration of the congelation has been from one to ten minutes.

In the spring of the year 1849, I requested the house-surgeon of Brighton dispensary to apprise me of every case of acute lumbago that came under his notice, and in all of these amounting to nine, I employed congelation with perfect and permanent success. The net containing the ice and salt was passed to and fro for five minutes, over a surface of about eight by four inches, the skin being blanched during the whole of this period. In only two or three cases was it necessary to apply the remedy twice. Several of the patients rose immediately afterwards from their beds to which they had long been confined. In most cases of chronic rheu-

matism, the remedy has been equally successful; and this, on account of the frequency of the disease, is one of its most valuable applications. Sciatica has generally yielded to it, but by no means so easily. In acute rheumatism, the local inflammation of the joints is, by this means, invariably and completely relieved, and that portion of the accompanying fever thence arising, is consequently removed. The disease, thus treated, will run a painless course of about a week's duration In no case, of about a dozen in which congelation was almost exclusively employed, was there extension of inflammation to the heart; and I am persuaded that the best plan of preventing this, is to subdue the inflammation of the joints from which it generally originates. I did not use the remedy in cases where the heart was already affected, though I have since learned that congelation is employed in the hospital at Vienna (where it was introduced some years ago by Dr. Waters of Chester,) as an application to the chest in rheumatic carditis. That this affection of the heart would occasionally occur during the treatment of acute rheumatism by congelation is very probable, because it often arises, as the same affection of the joint does, from a morbid condition of the blood over which the remedy can have no control; and that such an occurrence, in the present feeling on the subject, would be called metastassis from cold, is very certain; but I am convinced that it will yet be acknowledged, though probably after many years that this affection would be much decreased in frequency by the adoption of any means capable of quickly subduing the accompanying arthritis. When it is considered what an immense amount of eventual mischief arises from the organic disease of the heart that occurs under the common modes of treating rheumatic fever, to say nothing of the patient's present sufferings and tedious confinement, it is to be lamented that prejudice should oppose any means of greater promise. In rheumatic gout, the relief has been as marked from congelation as in lumbago. In ordinary inflammation of the joints it has also been exceedingly useful. Ophthalmia has been immediately cured by keeping the frigorfic in contact with the gently closed eye-lid for three or four minutes. Glandular inflammation in the neck and groin, yield to a high degree of cold with equal facility. I have been told that in orchitis, its beneficial operation is immediate; and I have little doubt that, from its closeness to the surface, the urethral inflammation causing orchitis, would be quickly suppressed.

Congelation has often at once converted an irritable into an healing ulcer, though sometimes the patient has complained of the pain of the operation; it is probable that had the salt in the mixture been prevented coming in contact with the irritable surface, this would have been in a great degree prevented Certain acute inflammatory affections of the skin are equally under its influ-

ence, as erysipelas, eczema, impetigo. It has not often failed in purigo, but in only one case of psoriasis has it appeared to be of service. Painful nodes are at once relieved by this means, and the inflammation subdued. I have only used congelation in carbuncle as an anæsthetic previously to cutting it, but it is probable (judging from its effects in severe boils) that the incisions might have been dispensed with. It has been mentioned to me that severe cold has been employed with the same view in whitlow, of which it is certainly a perfect cure. The inflammation following sprains, contusions and other similar injuries is perfectly under its influence; and the same may be said of burns. In one of my publications on the subject, I have related the excellent and speedy effect of congelation in a case meningitis, and also in a case of peritonitis; I have not had the opportunity of trying it in other affections of this description. Headache of various kinds has at once yielded to the application, for a minute, of a frigorific over the painful part; and in neuralgia affecting the side, it has generally proved efficacious. In neuralgia attacking the face and other parts, it has often succeeded and often failed. If the seat of the disease be deep in the brain, little can be hoped from this remedy, although there are few obstinate cases of neuralgia in which it does not deserve a trial. Toothache is generally at once relieved by it if properly applied; and there is no remedy for the painful affection of the mouth caused by mercury comparable to congelation. A spoonful of dissolving ice and salt is repeatedly put into the mouth, until it becomes benumbed. In one case of severe scurvy of the gums, where I feared a loss of the teeth, extensive congelation of the gums immediately arrested the disease.

In many of the diseases just enumerated, the promptness of the cure is as remarkable as its certainty. In military and hospital practice this advantage is very prominent.

In cancer the effects of congealation have been various. From my own experience, and that of others, I think that in early stages and when from its size the tumor can be thoroughly brought under the influence of the remedy, it will be cured by it. In all stages the progress of cancer will be arrested or retarded, and the pain accompanying it assuaged. The difficulty in advanced cases is to cause a sufficient degree of heat and cold to pervade the tumor.—The French translator of a recent paper of mine on the snbject(L'-Union Medicale for May,) thinks that the frequent occurrence of cysts in cancerous tumors may facilitate this. But if layer after layer is acted upon, it may be enough. In cancer of the womb the frigorific is applied by way of a speculum, and one stronger than ice and common salt will generally be required. The opinion of Dr. Hughes Bennett respecting the nature of cancer have much influenced the mode in which I have used congelation in its treat-

ment. M. Velpeau states in his recent elaborate work on diseases of the breast, that he has employed long-continued congelation as a substitute for caustic in cancer; but of this effect of the agent I have no knowledge.

There are other diseases in the treatment of which severe cold would probably be very useful. It might be applied with such a hope to the spine in tetanus, or to the scalp in certain varieties of mania. After gun-shot and other severe wounds, it would prove a powerful preventive and cure of inflammation. Even in pleuritis and other deep-seated inflammation of the chest, as well as in various uterine affections, benefit might rationally be expected from it. In two cases of epidemic cholera, I administered a succession of draughts of a temperature of about 25° Fahrenheit, with apparently excellent effect; and I cannot doubt that the application of cold to the interior of the stomach, which as appears by the recently published report of the College of Physicians, is the only treatment of cholera which has been unanimously approved of, has not been carried far enough. If the irritation of the mucous membrane be considerable (as it must be, to account for the exhausting and fatal discharges,) the temperature of ice merely is not sufficient to subdue it.

II. *Anæsthetic Uses of severe Cold.*—As patients now expect to have every operation performed without pain, both they and their surgeons will be glad to have an easy and agreeable means of accomplishing this, in all the common operations, unaccompanied with the dangers of chloroform. What can be less troublesome in opening an abscess, for instance, or making a cutaneous incision, than touching the skin for a moment with a brass ball that has been immersed for a few minutes in ice and salt, or a thin spoon filled with such a mixture? It is true, that in deep-seated operations such a means can only suspend the sensibility of the skin; but it is the incision of the skin which constitutes the most painful part of every operation and if this be benumbed, a smaller, and consequently less hazardous dose of ether or chloroform than has usually been administered, would be enough to remove the sensibility of the other tissues. These deep-seated operations, however, constitute a small minority, and if the list recorded deaths from etherization be referred to (now amounting to more than fifty) it will be found that in three-fourths of the number, complete anæsthesia might have been produced with perfect safety by cold.

M. Velpeau, who introduced anæsthesia from cold into France, has, in a lecture on the subject recently reported in the Gazette des Hospitaux, expressed the doubt, whether in some operations, the hardening of tissues might not prevent their being cut with ease. I have not found this to be the case, nor does he himself allude to this disadvantage, when, in his work on diseases of the

breast, he mentions that he has excised tumors after anæsthesia from cold.

The fear of re-action I have already adverted to in in the prefatory observations. Instead of re-action by being produced, the anæsthetic is a preventive of inflammation from the wound; and were it used for this purpose alone, it would be invaluable.

Local anæsthesia from cold may, as has already been observed, be produced in a great variety of ways. Some of these may be applied so as to cause immediate congelation, but it is questionable whether the anæsthesia is not more extensive and lasting when more slowly caused. Such details, however, are unsuited to the general view of the subject intended by the present communication, which, I fear, has already exceeded its proper bounds.—*Edinburgh Monthly Jour. of Med. Science.*

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*Remarks upon the Use of Beverages in Sickness.* By L. A. DUGAS, M. D.

Without intending for a moment to undervalue the importance of a judicious selection of the more active remedial agents in the treatment of disease, the writer nevertheless feels persuaded that much of the success of these, very often depends upon the use of proper adjuvants. The signal advantages frequently derived from the opportune administration of an enema, a foot bath, cold effusion to the head, or even a cup of tea, broth or gruel, must have been obvious to every discerning practitioner. And yet it is only at the bedside that the young physician can derive much information upon the subject, as these matters of detail, cannot be or are not included in such works of general practice as are usually placed in their hands. Treatises and Lectures upon the general principles of Practice are unfortunately but little relished by students, while they read and listen with avidity to specific plans of treatment, and never fail to note down any *recipe* that may be proposed. The more violent, heroic and perturbating methods are, however, gradually giving way to milder and more judicious medication; and palliatives consequently increase in importance. The skill of the practitioner will be found to consist more in the relief of existing symptoms than in the prescription of special formulæ learnt by rote and aimed at a name.

The use of aqueous beverages, especially in acute affections, is now so common that it cannot be a matter of indifference whether the patient partake of the one or the other of the many varieties ordinarily resorted to. The belief that the water they contain is the sole agent of value in their administration is too exclusive, and prevails to too great a degree. By the ingestion of large

quantities of water, and the great facility with which it is imbibed by the coats of the stomach and intestines, carried into the portal system, and from thence introduced into the general circulation, the blood is diluted and rendered less plastic, whilst the repletion of the vessels thus induced, gives increased activity to the emunctories—viz., the skin, lungs, and kidneys. The experiments of Magendie demonstrate very satisfactorily that the secretions are increased in a direct ratio with the repletion of the blood vessels, and vice versa; that absorption is promoted in proportion to the diminution of the circulating mass. While, therefore, in the treatment of acute diseases, which are generally inflammatory, copious beverages are usually found to be useful, by diminishing the plasticity of the blood, and promoting the elimination of noxious or effete principles, their propriety is very questionable when it becomes necessary to favor absorption, as is frequently the case in chronic engorgements, serous effusions, or other deposits. When venesection is practiced, the volume of blood abstracted is very soon replaced by water; whereas, by withholding such beverage, the partial vacuum of the vessels brings into them the circumjacent fluids with whatever disintegrated matters they may hold in solution. Thus it is that we may satisfactorily account for the agency of depletion and abstinence in the promotion of absorption. Yet it cannot be a matter of indifference whether the drink be acid or alkaline, stimulating or sedative, mucilaginous or acrid, laxative or astringent, nutricious or not. We resort daily to beverages which, in addition to the diluent property of water, unquestionably present or more of the peculiarites just referred to; and we should endeavor to select such as may be best adopted to each particular case. A brief enumeration of some of those in common use, and an appreciation of their peculiarities, may enable us to present our views more forcibly. They may be advantageously arranged under distinct heads, indicative of their most prominent properties.

Diluents.—Of all beverages, water, at the ordinary temperature of spring or well water, will be generally found the most agreeable, as well as the best, when the desired effect be simply to allay thirst or to dilute the blood. Indeed, the cravings of nature so strongly indicate the propriety of cold water as a beverage, in the fevers of our climate, that one cannot look back without a sense of horror upon the time when patients were pertinaceously denied this luxury notwithstanding their heart-rending entreaties; when they were compelled to linger through long attacks of sickness, with parched lips and cracked tongue, lest a sip of cold water might perchance disagree with the stomach, check the perspiration, or expose them to mercurial salivation! In no particular has modern practice displayed more good sense and humanity, unless it be in the abolition of chains and the lash in the treatment

of insanity, than in allowing the sick the free use of cold drinks, especially in Southern fevers. A draught of good cold water will often act like a charm, quieting the stomach, and inducing copious excretions from the skin, kidneys and lungs.

The facility with which ice is now procured in most of our towns, has led to the very free use of iced water; and, however grateful and beneficial this may be in many cases, there are circumstances in which the propriety of its use is at least questionable. In irritability of the stomach, with or without phlogosis of this viscus, iced water very generally gives great relief; but in affections of the bowels, we think it decidedly objectionable. In both diarrhœa and dysentery, its bad effects are almost immediately marked by the supervention of pain and a desire to go to stool. It should also be avoided in all colicky affections, whether partaking of the nature of obstructions, of spasms or of flatulency. In bowel affections we always give the preference to warm or hot drinks. According to our bed-side observations, iced beverages should be also avoided in pulmonary diseases, and in affections of the head. We have frequently found them to induce paroxysms of coughing and dyspnœa, lung complaints, as well as pain and cerebral disturbance in affections of the brain, while tepid or warm drinks do not produce such effects. The rationale of such consequences is so evident as scarcely to need an explanation. The principle is here the same as that upon which we account for the injurious effects resulting from the exposure of one part of the body to cold when another part is predisposed to or actually suffering from inflammation. No one would think of plunging in iced water the feet of a patient laboring under affections of the bowels, thorax, or head; nor should the stomach be filled with iced water under such circumstances, although this organ may be benefitted by cold applications of the kind to its own surface when this is affected. The same remarks may be applied to acute affections of the skin, and old women are therefore not wrong in objecting to iced drinks in scarlatina, measles, and small pox, however much they may err in insisting upon keeping the body excessively warm.

In the *cold* stage of our fevers, we think warm drinks preferrable to cold ones. They hasten the termination of the chill and bring on perspiration much sooner; and though they may be more apt to induce emesis, the very efforts to vomit materially determine the circulation to the surface, and consequently abridge the cold stage.

Demulcents.—Under this head we may place all the mucilaginous infusions, as those of Flaxseed, Slippery-elm bark, Prickly-pear Bee leaves, Gum arabic, &c. These are nothing more than diluents in combination with bland materials. They are regarded as especially appropriate in irritations, more or less intense, of the

alimentary passages, of the respiratory organs, and of the urinary apparatus. Their use has been so long sanctioned by the profession, that it is not without some hesitation that we intimate a doubt as to their real value, or rather as to their superiority over mere diluents. It can hardly be presumed that the gummy or mucilaginous materials they contain, pass into the circulation unchanged, or without previously undergoing the digestive process. They cannot therefore be viewed as bland applications to any other than the surface of the digestive tube. Yet they are continually prescribed as though they were destined to reach unchanged, the mucous surfaces of the lungs and urinary organs. We must confess that we have ourselves been so much in the habit of prescribing infusions of Slippery-elm and Prickly-pear in affections of the kidneys, bladder and urethra, that we would dislike to abandon them, however much we may be led by theory to doubt their intrinsic efficacy and to attribute the relief to the water and other medicinal agents with which they are administered. We must also say that we have never perceived any advantage in the use of demulcents, as such, in pulmonary diseases,—and that we really consider the one in most common use (flaxseed tea) often injurious, in consequence of the rancidity of the seed usually obtained from the shops, and the indigestibility of the infusion when made very mucilaginous, to say nothing of the unpleasantness of the dose. The other demulcents can be so readily procured in a fresh state, and are so much more agreeable, that we see no good reason for the very general use made of flaxseed tea.

The *Aromatic* beverages are infusions of mint, balm, sage, catnip, sassafras, &c. Their chief merit consists in being generally palatable and therefore well received by the stomach. In many instances they will relieve nausea, when this unpleasant symptom would be aggravated by demulcents. They are also decidedly antiseptic, preventing the evolution of gas by averting the tendency to fermentation, and improving the general tone of the digestive organs, without exerting injurious stimulation of the general system. They are particulary well adapted to typhoid fevers and diseases of similar character.

Catnip tea is a favorite prescription of mothers for crying babes, under the impression that the cries always indicate the existence of colic, and that catnip is a specific for this. It cannot be denied that the little creatures very frequently become quieted and go to sleep shortly after partaking freely of the well sweetened tea; but whether this effect is to be attributed to relief from colic, to some anodyne or soporific property of the tea, or simply to the fact that this operates as a substitue for the nourishment the child required, remains to be determined.

Sassafras tea is not unfrequently used in the South as a substi-

tute for coffee or hyson tea, and is certainly more palatable than either of these, when as wretchedly prepared as they are in many families. Sassafras has been long supposed to possess alterative properties, and has therefore entered into the composition of most of the so-called Diet Drinks. As we do not, however, profess to understand the true meaning of the term alterative, as used technically, and that we consider Diet Drinks in common use, as mere tonics or restoratives of the general stamina, we presume that sassafras has a beneficial influence upon the digestive organs. And yet it is difficult to determine the origin of a prejudice which exists in the minds of many of our people against its habitual use in consequence of its supposed tendency to production of intermittent fever. This prejudice is so general in Georgia, that it is supposed to have contributed largely some years ago to the defeat of a candidate for the gubernatorial chair, who had in Congress urged an increase of the duty upon tea and coffee, adding that if the enhanced price of these articles proved onerous to some, they might drink sassafras tea. The good people proudly refused to vote for any man who was willing to see them all take the ague and fever, merely for the sake of filling the National Treasury! We believe the prejudice to be unfounded, but would like to know if any facts can be adduced in support of it.

ASTRINGENTS.—The only beverages in common use in disease which possess any astringency are the green and black teas, and the sage tea. This effect is, however, so slight as to be unimportant in general.

LAXATIVES.—We may class as such the infusions of Tamarinds, of dried apples, of dried peaches, of raisins, and of cream of tartar; to which may be added Saratoga waer. These are all more or less grateful, and remarkably well adapted to a large class of our diseases, in which the intestines are disposed to be torpid. Those possessed of acidity promote an abundant secretion of bile as well as of gastro-intestinal fluids; hence their common use in warm climates.

ACIDS.— Lemonade and orangeade are such general favorites in diseases of tropical climates, that they are in some of the West India islands, considered as the most important medication in all affections implicating the hepatic secretion. As an anti-bilious remedy, lemonade is held in an equally high esteem by the Creoles as calomel is by the English, and those who borrow their views. Lemonade, besides being exceedingly grateful to the palate, is highly promotive of the mucuous, hepatic, renal and cutaneous secretions. The free flow of salivary fluids excited by its contact with the mucuous surface of the mouth and the orifices of the ducts that open upon it, will give some idea of its effect upon the gastro-intestinal surfaces and the glands whose ducts terminate in

them. The capillary circulation of these mucous membranes and glandular structures must therefore be much relieved of congestion, if any exist. But besides this local action, lemonade doubtless penetrates the general circulation by imbibition, and is carried to the kidneys and skin, whose secretions it manifestly increases. If the fluids of the system are alkaline, this is changed, and they become acid by the free use of this beverage. Producing such decided local and general effects, it would seem more proper to class lemonade among the potent agents of the materia medica, than among the mere adjuvants. We feel satisfied that the therapeutic value of lemonade, in the treatment of our fevers, from the simple intermittent to the dreaded yellow fever, has not been fully appreciated by those who indite most of the books upon our shelves—the Brittish, and our Northern brethern.

ANTACIDS.—There are states of the system in which Antacids may be eminently useful, especially if taken largely diluted or in the form of beverages. The officinal lime water, or small quantities of bicarbonate of soda, or of carbonate of pota s, may be thus used with plain water. The well water of blue limestone districts is sometimes of great advantage to dyspeptics. A very common error prevails with the non-professional public, who believe that soda enters into the composition of the beverage vended in our cities under the name of "Soda Water," which is nothing but water strongly impregnated with carbonic acid gas, and without any alkaline properties. The name of Soda Water had its origin in the fact that the carbonic acid gas was formerly obtained for the purpose by the action of acids upon the carbonate of soda, whereas it is now usually derived from marble or some other carbonate of lime. By the addition, however, of a little bi-carbonate of soda to this aerated water, a very pleasant and useful antacid beverage may be made.

SEDATIVES.—During the prevalence of the Broussaisian doctrine, which regarded nearly all diseases as abnormal irritations or inflammations, sedatives were eagerly sought after, in the vain hope that they would prove to be of general applicability. The distinguished French reformer, however, refused to acknowledge as such any other articles than Prussic acid and Asparagine. We may, perhaps, then be excused for placing under the head of sedatives the infusions of the leaves of the Orange tree, the Lemon tree, and the Peach tree, all of which we believe to contain more or less Prussic acid. Be this as it may, there is no doubt that they are exceedingly valuable beverages in our autumnal fevers. The orange-leaf tea is remarkably palatable to most persons, and in addition to being a good diluent, diaphoretic and diuretic, has a soothing effect that can scarcely be appreciated by one who has not realized it in his own person. To secure its

full influence, it should be taken freely when hot, and just made (by pouring boiling water upon the fresh leaves,) for it very soon deteriorates and becomes insipid. In the nervous affections of females, and especially in nervous head-aches, it often acts like a charm. The French make great use of the distilled orange flower water, a tea-sponful of which they add to a glass of sweetened water;—but we think the orange-leaf tea equally valuable, and this is within the reach of every one who has a garden, as the orange tree grows finely in this region of country, and with less trouble than is required to keep the usual supply of balm, sage, &c.

The infusion of Peach tree leaves is peculiarly useful in cases of irritable stomach, whether occuring in our fevers or after a debauch. In such cases, however, it should be made strong and given in small quantities at a time; say a table-spoonful or two, frequently repeated. In cases of hooping-cough, if given freely three or four times a day, it tends materially to lesson the violence of the paroxysms and the duration of the disease. We took occasion many years ago to allude to this use of it, and to recommend it in plantation practice as safe and valuable.

The last class of beverages to which we shall allude, comprehends those in which NUTRITIOUS elements are added to the diluent. The most common are water holding in solution Gum Arabic, Sugar, and the various syrups and teas made of toasted bread, rice, barley, &c. The value and applicability of these beverages are so evident, that we mention them merely for the purpose of completing the subject. Indeed we have extended our remarks so much more than we had intended when the theme first presented itself to our mind, that we now entertain serious apprehensions that the reader will be poorly repaid for the trouble of perusing them. We would accordingly withhold them from our pages, were it not that we still feel that the subject is one entitled to more attention than it has heretofore received, and that the imperfections of this hasty paper may induce others to do better.—*Southern Med. and Surg. Journal.*

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*Medicine a State Institution in Spain.*

The Gazette publishes a Royal Decree to the following effect: "Art. 1. Every town and locality in the kingdom are in future to be provided with physicians, surgeons and apothecaries, whose duty it will be to dispense medical aid to the indigent classes, and any other persons who may require their attendance.

"Art. 2. The existence of these physicians shall not prevent the free exercise of the medical profession in the same localities.

"Art. 3. The authorities will maintain in the free exercise of their profession, the persons who have been legally accredited, in virtue of the present decree, and other ordinances in force.

"Art. 4. The physicians, independently of their attendance on the sick, will have to take charge of foundlings, to decide whether substitutes are fit for the military service, and to visit sick soldiers passing through their districts. They are not to absent themselves from the town in which they practice during more than twenty-four hours without the permission of the Alcalde, and for a longer period without providing a substitute. Their salary is to be proportioned to the population of the district, the wealth of its inhabitants, and other local circumstances. They will be entitled to a pension after practising thirty years in the same district."—*London Times.*

*Analysis of Black Vomit in Yellow Fever.*

1. When black vomit is filtered, the colouring matter remains upon the filter, and the filtered fluid is colorless.

2. The specific gravity of the filtered fluid varies from 102 to 103.

3. The filtered fluid always reddens litmus.

4. Nitrate of silver when added to tho filtered fluid form a large quantity of white precipitate, which is insoluble in nitric acid, but soluble in ammonia; hence the fluid contains hydro-chloric acid.

5. Lime water, kali nitricum. and the other alkalies, form no other precipitate with the fluid, either when submitted to cold or heat.

6. A solution of the bi-chloride hidrarg. produces no apparent reaction with this filtered fluid.

7. Muriate and nitrate of baryta each prduces a slight turbulence when added to the filtered fluid.

8. Acetate of lead added to the filtered fluid causes a white flocky precipitate, which is insoluble in water, but soluble in acetic acid; hence mucous exists in the fluid.

9. A precipitate is formed by nitrate of silver in solution being added to the filtered fluid. If kali purum be added to this mixture, it deprives it of all acid; and then, afterwards, if sulphuric acid be added to this, a slight effervescence will ensue. Hence, we infer the existence of carbonic acid gas in the fluid.

*Coloring Matter of Black Vomit.*

1. It presents the appearance to the naked eye of blood globules which have been separated by chemical means from the blood.

2. When dried by artificial heat or the atmosphere, it resembles hemastosine procured from man's blood.

*Microscopic Analysis.*

A homogeneous fluid that contains—1. Blood globules entire. 2. Fragments of globules. 3 Mucus. 4. Epithelial cells. 5. Amorphus matter. 6. Granules sometimes. 7. Fat globules. 8. Torulæ and spores.—*New Orleans News & Hospital Gazette*, Sept. 1854.

# BOOK NOTICES.

*Experimental Researches*, illustrative of the Functional Oneness, Unity, and Diffusion of Nervous Action; in opposition to the Anatomical Assumption, of four sets of nerves, and a fourfold set of functions, and transmitted impressions; with a brief exposition of the Philosophy of Vivisection, and of Sensation. By BENNET DOWLER, M. D, of New Orleans.

The above is the title to a pamphlet of 66 pages, republished from the New Orleans Medical and Surgical *Journal;* and though recently received by us, it bears date in 1851. The nature and objects of the essay are sufficiently indicated by its title. It contains several of Dr. Dowler's well known experiments on the alligator, accompanied by criticisms on the generally received doctrines in relations to the functions of the nervous system.

We have read this paper carefully for the purpose of ascertaining what the real sentiments of the author are, and how far these sentiments are legitimate deductions from his experiments. We say that we have read the paper carefully, because there is in it a certain kind of vagueness and want of arrangement, which makes obscure the meaning of the author, and very much diminishes the satisfaction derived from a perusal of his work. He strikes boldly at existing opinions, and by his experiments produces results well calculated to shake our confidence in many things which have been regarded as settled physiological truths, and yet he fails to afford us a foundation for anything more satisfactory in their place. By his experiments on the alligator, he has shown conclusively enough that, after decapitation, and even after destruction of both brain and a large part of the spinal cord, the headless trunk and limbs are capable of making co-ordinate and intelligent movements.

From these experiments he is led to deny, first: That there is any such quadruple division of the nervous system, either anatomically or physiologically, as claimed by Sir Charles Bell and Marshall Hall. He denies the existence of sufficient facts to show

that there are distinct nerve filaments for ordinary sensation and motion, and involuntary sensation with reflex motion; but claims the unity or oneness, in function, of the whole cerebro spinal nervous matter.

Second: He denies the doctrine of a central or common sensorium, to which all impressions are transmitted to be recognized; claiming that it is *diffused* throughout the whole nervous system; and consequently that the nervous cords are not transmitting in their function but directly sensuous in every part where impressions are made. Hence he says:

"The doctrine of an exclusive sensorium—one restricted wholly to a spot in the brain, contradicts not only the universal intuition or experience of mankind, but is self contradictory; for sensation can have no existence in time and space, only so far as it is *felt;* it exists only at the time when, and the place where, it is cognized. At all other times and places it has no existence whatever. The pain of a whitlow is felt in the finger, and not in the optic thalami or crus cerebri."

Again he says, "the doctrine of a diffused sensorium, is an intuitive conviction; based on consciousness, at least it is such, with all not educated in a different belief."

And again: "The rejection of a *diffused sensorium*, and the general admission of one exclusively central, are, probably, in a considerable degree owing to the psychological, or rather the theoretical difficulties with which education has environed these views, in assuming them to be incompatible with the supposed oneness of life, personal identity, the union of volition and sensation."

In contending that the nerves are not mere conducting cords, but possessed of perceptive or cognate qualities, Dr. Dowler uses the following language, viz.:

"Physiologists who reduce the nerves to the condition of mere conductors to and from a central, yet unknown, unconscious spot, called the sensorium, in some unrevealed part of the brain, ought not to regard themselves as honoring the nervous system, any more than those who are willing to allow these supposed conductors a *share of sensational cognition.*" * * * "Sensation is not produced by the intermediary agents called transmitted im-

pressions or ideas, but is an intuitively felt relation, between the *Me* and the not *Me*." * * * * * "When an object is touched, the result is a felt relation directly between the subject and object, *not* between the subject and a *mere representation* of the object."

These extracts are sufficient to show the correctness of the two propositions already given as embodying the peculiar sentiments of the author. To sustain these views, he adduces his experiments on the Alligator, already alluded to; the fact that some of the lowest species of animals may be cut into many pieces, and each piece not only retain its vitality but increase in bulk, and exercise all the functions of the whole animal; the fact that under certain circumstances muscular contractions may be induced several hours after death; and finally that persons with extensive injuries of the brain and acephalous fœtuses have given proof of both perception and intelligent movements. It may be well briefly to examine these several classes of facts and see how far they warrant the conclusions of the author. That several of the lower species of animals possess only the most simple or rudimentary form of a nervous system, without any central organ or cephalic ganglia, is a well known fact. And it is doubtless true that in such, each portion of the nervous matter is independent of the rest, and equally independent of any common sensorium. But it is equally true, that some of these animals have no central or special organs of respiration, circulation, or digestion—no lungs, no heart, and no stomach; but each part of their organization imbibes its own air and nutriment and performs its own excretion. Hence each part is capable of an independent life, and when separated from the rest will often retain its vitality and continue its growth. But to allege the apparent independent vitality of each part of these primitive types of the animal kingdom, as evidence of a "diffused sensorium" in the higher classes or in man, would be just as absurd as to allege the same fact in proof that man had a "diffused" digestion or respiration.

The facts in reference to the organizations are not analagous, and consequently do not admit of an analogical deduction.

To invalidate the inferences drawn from experiments, by which

muscular contractions have been found to follow pinching or irritation of the anterior roots of the spinal nerves; and by which the filaments composing these have been considered as the peculiar nerves of *motion*. Dr. Dowler adduces the results of many experiments to show that muscular contraction is equally produced, and even in a much greater degree, by blows on the muscles after death, or after separation from the body as in amputated limbs, and sometimes spontaneously after death from certain diseases like cholera. Granting both the correctness and the physiological importance of these experiments and observations, still they have no bearing on the question raised by the author. Had he wished to illustrate the truth of the old Hallerian doctrine, that the muscles contain an inherent property of irritability or contractility, independent of the nervous system, his experiments by which contractions were induced by blows, electricity, &c., after the functions of the brain and nervous system had ceased, would have been directly and highly appropriate. But in the application of the facts made by him, he has confounded *contractibility itself* with the *excitors* of contractions; two things essentially distinct. The muscular structure doubtless contains an inherent property of contractibility; and while it retains this it is capable of contracting on the application of a certain stimulus or excitor, no matter what may be the condition of the nervous system. Hence if blows or galvanic currents, &c., induce contractions, it simply proves that these agencies may, under certain circumstances, become *excitors* of muscular contraction; but it by no means proves that such agencies are the *usual* excitors, and much less that other agents may not act as much more *efficient excitors*, by exerting an influence through the nervous cords distributed on the muscles. On the contrary Dr. Dowler's own experiments on the alligator demonstrate, many times, the power of exciting muscular contractions by impressions transmitted through the nervous cords.—All that can be legitimately claimed, then, is that impressions through the nervous cords are not the *only* excitors of muscular contractions; but that they are the *usual normal* excitors, is in no wise disproved by anything in the essay before us. Again, in his anxiety to establish the doctrine, that the nervous cords are

not merely *transmitting* in their function, but themselves the veritable seat of perception or "sensational cognition," Dr, Dowler quotes as the opinion of Sir Charles Bell, the statement that "loss of power in consequence of tying a nerve, was not owing to compression of the tubes of the nerve, but to the obstruction of blood vessels." And after alluding to the complete insensibility produced by the stagnation of blood in the capillaries, he gravely asserts that, "these facts show, that the non-circulation of the blood, produces a loss of motion and sensation, rivaling in instantaneousness and completeness the division of the nerves, which latter operation constitutes the *experimentum crucis* of neurological dynamists." Here again, the author is right in his facts, but wrong in the inference he would have the reader draw from them. He seems not to remember that three distinct things are essential to the action of a nerve of ordinary sensation, viz: susceptibility in the nerve itself, continuity of its fibres, and an object to make an impression. The first may be suspended or destroyed by the direct application of chloroform, or hydrocianic and carbonic acids, or by cutting off entirely the supply of arterial blood; and while the susceptibility thus remains suspended no action can be excited in the nerve. This, however, furnishes not the slightest proof that the nerve, in its normal state, is not transmitting or conducting in its function. But if we leave the supply of blood to the nerve unobstructed and the susceptibility of its distal or peripheral extremity unimpaired, and find by interrupting the continuity of its fibres in a distant part of their course, that its action is entirely suspended and all sensation through it cut off, it does furnish proof, positive and clear, that the nervous cord is a medium of communication between the surface and some central point within. So far from proving that the nervous cords are not *conductors* of impressions, or that sensational cognition takes place in the extremity of the nerve where the impression is made, all the facts adduced by Dr Dowler simply show that the action of a nerve may be suspended by suspending its elementary susceptibility; a fact long well known to every enlightened physiologist. But our comments are extending too far and we must hasten them to a termination.—

Dr. Dowler's experiments on the alligator have clearly demonstrated that it is one of those cold-blooded animals which possess great tenacity of life; that the several parts of its nervous system are apparently more independent of each other, and retain their susceptibility longer after mutilation than any of the higher orders of warm-blooded animals; but we think they fall far short of establishing the proposition that, in man or any of the higher orders of animals the "*sensorium is diffused*" throughout the nervous system, or that "sensational cognition" actually takes place at the peripheral extremity of the nerve without transmission to the brain or the nervous centres. The brief criticisms in which we have indulged, have not been intended to disparage the interest or value of Dr. Dowler's experimental and physiological researches. The latter have given him a deservedly high reputation in the scientific world, and we hope he may live to make many more additions to the sum of human knowledge as well as to the reputation of the profession to which he belongs. We believe there is much yet to be learned in relation to the functions of the nervous system. That the doctrines of Marshall Hall and his followers are unnecessarily complex and unsupported by facts, we are well assured. We recorded our decided dissent from his views, in an article published in the transactions of the Medical Society of the State of New York, so long ago as 1842; and all our subsequent observations have only confirmed the views then expressed. D.

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## MEDICAL NEWS.

*Hendricks County Medical Society, Indiana.*

This Society was organized by a called meeting of the Physicians of the County and vicinity, held at Danville, Hendricks Co., Indiana, April 29th 1854. The following are the officers for the year ending April 1855.

*President*—Henry G. Todd, M D., of Danville.

*Vice President*- Wilson Lockhart M.D., of Plainfield.

*Secretary*—J. Joel Wright, M.D., of Monrovia, Morgan Co.

*Corresponding Secretary*—Dr. L. Howard Kennedy, of Belleville.

*Treasurer*—Henry Cox M.D., of Danville.

*Censors* { Dr. Thomas B Harvey. of Plainfield.
" { Dr. Bradley Bartholemew, of Danville.
" { Henry H. Moore, M.D., of Brownsbury.

The *Constitution* of the Society provides. for the election of the foregoing officers by ballot annually—It provides, that, any regular and reputable practitioner of medicine may become a member: it provides, that, any distinguished literary gentleman may become an honorary member: it provides for the formation of a library, and a cabinet of specimens. The *By-Laws* provide. that the regular meetings of the society shall be held on the *third Tuesday* of the months of *January*, *April*, *July* and *October*, of each year; the April meeting being the annual meeting: they provide that, the President shall appoint at every meeting at least one person to write and deliver a dissertation at the next; th y provide that every member shall have the privilege of reporting at any regular meeting, such cases (that have come under his own observation) as he may deem important: they provide that each member shall keep a faithful record of each important case of which he treats, and present the same to the society at the first stated meeting in each year, &c., &c.

MEMBERS

| | |
|---|---|
| Henry G Todd, | Wilson Lockhart, |
| Henry H. Moore, | Henry Cox, |
| Thomas P Seller, | B. Bartholomew, |
| Risdon C. Moore, | J. Joel Wright, |
| Leroy H. Kennedy, | D J. Depew, |
| Thomas B. Harvey, | I avid Todd, |
| J. A. Cominger, | W. Foster Harvey, |
| D. Hutchinson, | Wm. Matthews, |
| A. M. Reagon, | J. L. Green. |

*Extract* from the proceedings of the 4th regular meeting:

BELLEVILLE, 10th Month (Oct.) 17th. 1854.

At 11 o'clock A. M., the Society met at Masonic Hall. The minutes of the preceding meeting were read and approved. On motion of Dr. Wright the order requiring the dissertations to be read in the forenoon session, was suspended Then adjourned until 1 o'clock P. M.

AFTERNOON SESSION.

At 1 o'clock P. M., the members convened. Members present:

Drs. H. G. Todd, Bartholomew, Lockhart, Cominger, Matthews, T. B. Harvey, Cox, Kennedy, and Wright.

A Dissertation was read by Wm. Matthews M.D., on "The Varieties and Complications of the Typhoid Fever of the Interior of Indiana."

A protracted and highly interesting debate was then had, upon the subject of "Typhoid Fever," in which most of the members participated.

On motion of Dr. Cominger the discussion was brought to a close, and the Society proceeded to other business.

Dr. Kennedy, on behalf of the committee on Publication, submitted the following report—*i e.*

We the committee on Publication of Constitution, By-Laws &c., have furnished the Society with two hundred copies of the same, for which we agreed to pay twenty-three dollars—three dollars more than we were authorized by the Society, we ask the society to pay the *extra* three dollars,

L. H Kennedy,
H. Cox,
J. J Wright,
} Committee.

Ordered that the treasurer pay 23 dollars to the committee on publication, to defray the expenses of printing two hundred copies of the Constitution, By-Laws &c.

The censors presented in due form the name of David Hutchison, M.D., as an applicant for membership, recommending his election.

He was elected accordingly.

It was voted that 6 copies of the Constitution, By-Laws, &c., be presented to each member of the Society, in addition to those they had already received.

The President appointed David Hutchison M. D., to read a Dissertation at the next meeting.

Dr. R. C. Moore not being present, on motion he was requested to read his Dissertation at the next meeting.

Then adjourned to meet at Plainfield, at the regular time in course.

HENRY G. TODD, M. D., Pres.
J. JOEL TODD, M. D., Sec.

# EDITORIAL.

*Credit to whom Credit is due.*

"Render to Cæsar the things that are Cæsar's," was a reply that puzzled the wise men of Judea not a little; and it was brought forcibly to my mind while reading the little volume entitled, Bernard and Robin on the Blood, by Dr. Walter F Atlee, which was noticed in the December number of the Journal by my editorial colleague, Dr. Johnson. Whether it is the fault of M. Bernard or of his reporter, I do not know, but it is certain that one not well versed in medical literature would get the impression, from reading this book, that very little had been done in the way of investigating the composition of the blood and it changes, outside of Paris. Some facts are stated as though they had only recently been brought to light by M. Bernard, which have been known to the profession for many years; and both the distinguished French savan and his reporter, Atlee seem to be entirely ignorant of some things which have been done on this side of the Atlantic. For instance in speaking of the blood in the renal vein, compared with that in the arteries, the book before us says: "this blood," (from the renal vein) "as Simon has shown, and he alone has made an analysis, comparing it with the arterial, contains no fibrine. **** There is less water in the vein, for the urine carries it off, and the solid matters are in a greater proportion, because there is less water. If the fibrine be added to the albumen in the arterial blood, it equals the albumen in the venous, as if the fibrine had been transformed into it." And again: "The albumen *augments in the renal* venous blood, and M. Bernard is disposed to believe that it is owing to a transformation of the fibrine; for looking at the ciphers in the tables, we see that it is just what is wanted to compensate for the difference in the albumen."

Now, these brief extracts contain no less than *three* important errors viz: 1st, Simon is not the *only* man who has made an analysis of renal venous blood. 2nd, It is not true that in all instances renal venous blood contains *no* fibrine. 3d, The amount of Albumen is not always *positively augmented*; nor augmented in strict proportion to the loss of fibrine. If Dr. Atlee will turn to a paper read by me before the American Medical Association, at Charleston in May, 1851, entitled "An Experimental Inquiry concerning some points in the Vital Processes of Assimilation and Nutrition;" he will find among other things, the following quotation, viz:

"There have been numerous analyses of venous blood in comparison with arterial, but without any reference to the particular parts from which the venous blood had been returned. The one exception to which allusion was just made, was by Simon, who procured the blood from the renal veins, the hepatic veins, and the aorta of a horse, and subjected each specimen to careful analysis, particularly in reference to the quantity of *fibrine* contained. The results are given on page 139 of his work on the Chemistry of Man, and are as follows, viz.:

| | Renal Vein. | Hepatic Vein. | Aorta. |
|---|---|---|---|
| Water, | 778,000 | 725,000 | 790,000 |
| Albumen, | 99,230 | 130,000 | 90,300 |
| Fibrine, | 000 | 2,500 | 8,200 |
| Whole solid matter, | 222,000 | 275,000 | 210,00 |

This presents truly a striking result; the blood returning from two of the largest secreting organs in the body is found to contain far less *fibrine* and *water*, and more *albumen* than that from the aorta. But there are two circumstances which render this analysis unsatisfactory. First, the horse from which the blood was taken, was not healthy, and was in a *starved* condition. Second, the quantity of blood obtained by Simon from the renal veins, was insufficient to determine accurately the proportion of fibrine, being only 50 grs. To obviate these objections, and at the same time add another important element to the comparison, I procured a large, healthy and active dog, and procured some blood from the

renal vein, the illiac vein, and the illiac artery, in the following manner. The dog was stunned by a blow on his head, the abdomen quickly laid open, and a ligature passed around the renal vein near its entrance into the ascending cava, when on puncturing the vein 590 grains of blood flowed readily into a clean cupping glass. A ligature was next passed around the illiac vein, and on puncturing it, 771 grains of blood were collected in another cup. The illiac artery, being now easy of access, was punctured and the blood in a full pulsating stream, and received into a third cup, to the amount of 1816 grains. * * * *

All these specimens of blood were most carefully analyzed, following the method recommended and so long practised by Andral and Gavarret, with the exception of the mode of separating the fibrine. For accomplishing this most accurately, I fully agree with Mr. Bence Jones, preferring to allow the blood to coagulate perfectly, and then enclose the whole clot in a clean, fine linen cloth, and wash it with distilled water until the red corpuscles are entirely removed. The results in tabular form are as follows, viz:

| | Blood from the Iliac Artery in 1000 parts. | Blood from the Iliac Vein in 1000 parts. | Blood from the Renal Vein in 1000 parts. |
|---|---|---|---|
| Water, | 812 20 | 811.40 | 802,40 |
| Solid Matter, | 187,80 | 188.60 | 196.60 |
| Of which was fibrine, | 2,20 | 2,50 | 1,70 |
| Extractive Matter and Albumen, | 98 10 | 89 50 | 98 50 |
| Red Corpuscles. | 82 50 | 92 70 | 92,20 |
| Salts, | 5,00 | 3,90 | 4,20 |

From this extract, which together with the whole paper, was published in the North Western Medical and Surgical *Journal* for September, 1851, it will be seen that the blood of the renal vein *was analyzed* by me *five* years since; that the blood so analyzed *did* contain *fibrine*, though in a much smaller proportion than the arterial blood of the same animal; and finally that the albumen in the blood of the renal vein, instead of being increased in proportion to the diminution of fibrine, is not positively increased at all.

Its slight *apparent* increase being less than it should be from the diminished proportion of water. It is not at all strange that M.

Bernard, should be ignorant of the paper containing the foregoing analyzes; but the *representatives* of our profession abroad should be well informed in regard to the state of medical investigations at home: and especially should this be the case with such as take it upon themselves to publish books after they return home. The largest portion of the paper read by me to the American Medical Association in 1851, was occupied with the results of a somewhat extensive series of experiments in relation to the influence of diet and drinks on the functions of respiration and calorification. Some of these results I find are not in consonance with the views of M. Bernard.

For instance he alledges that the temperature of the body is the highest at the *end* of the active period of digestion, that is, about six hours after taking food. I made numerous experiments in reference to this point, and have always found the highest temperature *during* the most active period of digestion, instead of at the end of that process. In the paper alluded to, the results of some of these experiments are given as follows, viz: "The observations were repeated six times each day, at 7½ o'clock A. M., half an hour before taking food; at 10½ A M., two and a half hours after breakfast; at 12½ P.M., immediately before dinner; at 3½ P.M., two and a half hours after dinner; at 5½ P.M., half an hour before tea; and at 8 P.M., two hours after tea. The following is the average result of 16 days' observations under the influence of an ordinary mixed diet, viz:

| | 7½ o'clock, A.M | 10½ A.M. | 12½ P.M. | 3½ P.M. | 5½ P.M. | 8 P.M. |
|---|---|---|---|---|---|---|
| Av. Temperature. | 94° F. | 96° F. | 95° 2 F. | 96° 7 F. | 95° 2 F. | 96° F. |
| Highest, | 94° 5 F. | 97°3 F. | 96° F. | 97 2 F. | 95° 5 F. | 96° F. |
| Lowest, | 93° 7 F. | 96° 6 F. | 94° F. | 96° 3 F. | 95° F. | 96° F. |

From this table the inference is plain that the temperature of the body is uniformly from one to two degrees higher during the active stage of digestion, that is, about *two* hours after eating, than after the digestive process is fully completed.

Similar experiments were made in reference to the temperature of the system under the influence of a diet exclusively corbonaceous, and under that of a diet wholly nitrogenous; the results of which are given in the paper, and correspond closely with the

above so far as relates to the influence of digestion. I am aware that the paper to which I have alluded as having been read to the American Medical Association in 1851, attracted very little attention, and after its publication, I do not know that it was either copied or commented on by any of the medical journals in the country. And though the experiments, observations and analyses, detailed in it, cost me much tedious labor and time, yet I might have persuaded myself that the results were really of no importance, had it not been that similar experiments and observations have been made and published in European journals from time to time since, and these have invariably been copied and sent the round of American journals as though they possessed much interest.

This fact seemed to justify me in again calling attention to my own work. It has been frequently alleged as a defect in American Medical Literature, that it contained so little matter of original experimental character.

And probably the best mode of supplying the defect, would be to render full and prompt credit to such individuals as do attempt investigations of this character; for there are few things more discouraging, than to spend much time and labor on experimental inquiries and see the results entirely neglected or overlooked until some European savan takes up the same subject, perhaps spends less than half the time, and announces results very similar, which are caught up with avidity and copied into every journal in the Union. D.

*Sugar-house Remedy for Consumption.*

Some time since a story passed the rounds of the newspaper press, setting forth that Samuel A. Cartwright, M. D., of New Orleans, had discovered the important fact, that the inhalation of the vapor from the boiling cane-juice in sugar-houses was capable of curing *consumption*. Such a representation purporting to come from an eminent member of the profession, was sufficient to induce a considerable number of sufferers, some of them in the last stages of *Tubercular Phthisis*, to resort to these establish-

ments with a hope of relief. Of course the greater number were entirely disappointed. In a recent number of the Boston Medical and Surgical *Journal*, Dr. Cartwright publishes an article, headed "The sugar-house cure for bronchial, dyspeptic and consumptive complaints;" in which he says: "The author has never recommended the sugar-house remedy as a cure for consumption *in its last and hopeless stages;*" but newspaper misrepresentations and incorrect abridgements, altering the sense more or less of what he did say, have done it for him, and will assuredly bring the sugar-house cure for bronchial. dyspeptic and consumptive complaints into disrepute unless timely corrected. The precise limit of the efficacy of the inhalation of the vapor of boiling cane-juice, in opening the obstructed bronchial tubes and in influencing favorably, their mucous lining, is not yet ascertained; but that it possesses some remarkable virtues in this respect, there is much good evidence to prove."

From the whole tenor of the article before us, we infer that Dr. Cartwright intends to claim for the sugar-house vapor, curative powers only in cases of chronic bronchitis, certain forms of dyspepsia, and the *incipient* stages of *tubercular phthisis;* and not that it has any control over the progress of *tubercular cavities* and ulcerations, constituting the advanced stage of true consumption. But he is far from being very explicit in defining what class of cases would be most certainly benefitted by a resort to the proposed remedy. The subject is worthy of a careful investigation by those members of the profession who have abundant opportunities. D.

*Pumpkin Seeds for Tape Worm.*

A sufficient number of cases have been reported to show that the emulsion made of Pumpkin seeds possesses some real efficacy as a remedy for the expulsion of *tape-worm.* The usual mode of using it, is to remove the rind from the seeds, bruise the latter in a mortar, and infuse them in water, in the proportion of two ounces of the seeds to half a pint of water. After standing a few hours the whole assumes the form of an emulsion or thick mucilage. The

whole of this should be taken by an adult, in the morning fasting; and in two or three hours after, sufficient castor oil should be given to move the bowels freely. If this does not cause expulsion of the worm, repeat the same the following morning.

*Honors Properly Bestowed.*

It is well known that during the latter part of the past summer, the city of Savannah, Ga., was terribly scourged by yellow fever. When the epidemic was at its height, several of the resident physicians fell victims to it, and to supply their places others left their homes and volunteered their services. Among these were Drs. Hamilton and Redwood, of Mobile, and Dr. Cross. of New Orleans. Recently a meeting was held over which the Mayor presided, and each of the gentlemen named was presented with a service of plate, as a token of gratitude on the part of the citizens. At the same meeting resolutions were adopted commending the conduct of the resident physicians generally, and proposing to erect a monument to the memory of those who had fallen during the epidemic.

*Acne.*—For the cure of these troublesome and unseemly pimples which so often appear on the face, Cazenave has recently recommended the application of a solution of some of the Ammoniacal salts. The hydrochlorate or acetate may be used. He supposes the Ammonia to be capable of so acting on the fatty matter in the follicles as to convert it into a soap easy of solution and discharge

*The New Volume.*

The present number commences the 4th volume of the *New Series* of the North-Western Medical & Surgical Journal. We have not now, either time or disposition to review the past or speculate on the future. We wish merely to say that we commence the new year under arrangements which we believe will insure promptness and regularity in the issue of the Journal, and correctness in all its business relations. All the books and accounts of the Journal

past and present have been transferred to N. S. Davis, one of the editors; and to him should all remittances, letters and papers be addressed. Whatever untiring industry and effort, on the part of the editors, can do to make the Journal one of the best in the United States, *shall* be done. But editors can no more make a good journal and keep it good without the prompt support of their patrons, than could the Israelites in Egypt, make bricks "without straw." Hence we hope our patrons will be prompt in furnishing both money and communications. The series of articles in relation to the causes and treatment of fevers, resumed in this number, will not occupy a place in every number, but will be completed, if possible in the present volume. The next number will contain an address on the 'Influence of Alcoholic drinks on man,' delivered by request, to the class in Rush Medical College on last Christmas day. This address will embody the results of many original ex periments, and we trust it will be found interesting to the profes-siongenerally. *Perseverentia omnia vincit, et nil desperandum.*